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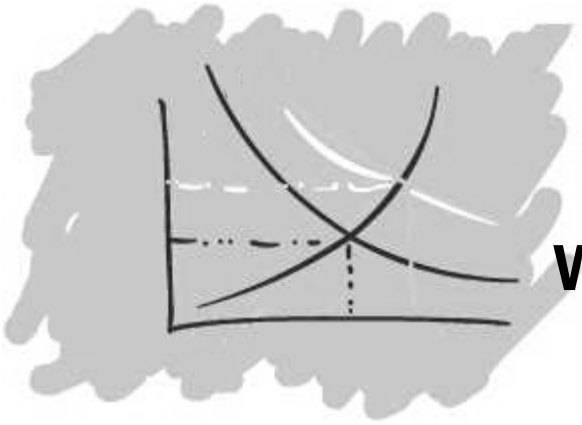

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Maternity and working life: Reconsidering the effectiveness of part-time employment

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Maite Blázquez Cuesta and Julián Moral Carcedo

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Maternity and working life: reconsidering the effectiveness of part-time employment

Maite Blázquez Cuesta
Univ. Autónoma de Madrid

Julián Moral Carcedo*
Univ. Autónoma de Madrid

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Abstract

The way in which professional and familiar life are reconciled might have important economic consequences both at individual and aggregate level. While as a flexible form of employment , part-time work may serve to reconcile professional and family life and increase female participation in the labour market, it can also give rise to new forms of inequality, thereby undermining the equal opportunities objectives established by the EU social policy. Creating substantive equality between part- and full-time workers and achieving gender neutrality means, above all, to ensure that those workers who combine part-time work with child care responsibilities do not suffer detrimental consequences in their career prospects. Although several actions at European Community level have been undertaken in the last decade to achieve greater equality between part- and full-timers, there is still evidence of a close relationship between atypical work, forms of parental leave, and gender discrimination in the labour relations of Members States. In this respect, many academic works have convincingly demonstrated how part-time workers are very often at a disadvantage when compared to their full-time counterparts. One disadvantage not explored yet in the current literature is the higher probability of transition into non-employment amongst part-timers. In this paper, we focus on the effects that the existence of differences in these transition rates between part- and full-timers, and the subsequent persistence of non-employment episodes, have on female career prospects. We present a theoretical model that incorporates those differences in unemployment risk and that serves us to conclude that, when part-timers experience higher probabilities of exiting the labour market, this form of employment becomes less attractive for women with child care responsibilities. This might serve to explain why

*Corresponding author: Department of Economic Analysis, Universidad Autónoma de Madrid. Ctra. Colmenar, km 15. Cantoblanco (28049). Madrid (Spain). Email: julian.moral@uam.es

in some countries full-time employment is the preferred option for mothers who want to remain in the labour market.
Keywords: Childcare, Part time employment.
JEL Codes: J13, J22

1 Introduction

The manner in which professional and familiar life are reconciled has important economic consequences at different levels. On the one hand, full-time jobs with rigid working hours can, from an individual point of view, make maternity the inescapable counterpart to pursuing a successful career path. On the other , the existence of restrictions to conciliate personal and professional life appears to have significant effects on fertility rates (which, in the long-run, exerts a negative effect on the population structure of ages and labour supply , thus questioning the viability of the pensions system), rates of activity, productivity, human capital (when people abandon the labour market to have a children coincides with the stage of high relative productivity), etc.

Furthermore, when childcare activities are unequally distributed among genders, discrimination can also emerge, both in terms of wages and employment probabilities (see for example Gunderson (1989)). The traditional role of women as the main, and usually unique, member of the couple responsible for childcare activities can affect their wage earnings negatively. Since the existence of childcare responsibilities is typically associated with certain labour market patterns like job-search restricted to home proximity, work absenteeism, career and formation interruptions, rejection of job promotions, etc., maternity decisions usually come to imply a cost in terms of human capital accumulation, particularly if women decide to abandon the labour market either temporarily or permanently. In this respect, Walfogel (1997) points out that the "wage gap" between women with and without children can be partially explained on basis of human capital considerations. Since women with children spend more time out of the labour market, they have less labour market experience and, as a result, a lower level of human capital accumulation which, in turns, reduces their wage earnings.

One of the most widely used instruments to conciliate professional and familiar life is part-time employment. As Del Boca (2002) points out, the lower levels of part-time employment observed in southern European countries like Italy and Spain are associated with the low employment rates observed among married women, particularly those with children. This would suggest that, in these countries, remaining in full-time employment or exiting the labour market are the most common choices for women with childcare responsibilities. Unfortunately, a relatively large share of them tend to choose the later option.

One of the main advantages of part-time employment is that it may offer a better balance between working life and family responsibilities. However, as suggested by many studies (Ermisch and Wright, 1993; Waldfoel, 1997; Dekker et al., 2000), part-time workers are

very often at a disadvantage when compared to their full-time counterparts. Typically, they have lower early wages, are less well-protected, receive fewer fringe benefits and have more limited career prospects . Different arguments have been used to explain such differences between part- and full-timers. Montgomery (1988) argues that recruiting and training costs discourage firms from hiring part-time workers. The lower wages earned in part-time jobs can also increase the likelihood of job offer rejection.[1] Ermisch and Wright (1993) point out that the use of part-time work as a form of parental leave implies that women will be segregated on the labour market. As a result, the bargaining power of female employees concerning aspects like wages will be decreased. The reason is that, for women with childcare responsibilities, the possibility of reducing the number of working hours is more valuable than earning higher hourly wages. Finally, as mentioned above, another explanation to wage differentials relies on differences in human capital accumulation. Since current and past episodes of part-time employment might lead to lower rates of human capital accumulation, this can result in a decrease in terms of wage earnings.

Furthermore, as Gregory and Connolly (2007) have pointed out, while the gender pay gap has been narrowing for women in full-time jobs, the pay penalty for part-time women has risen, partially reflecting the marked polarisation of part-time jobs into low-paid occupations. More worryingly, as these authors found , is the occupational and salary downgrading experienced by many women, who have previously held higher level and better paid jobs, when taking a part-time employment.

Part-time jobs are not only disadvantaged in terms of wages, but also in the risk of becoming unemployed. Data extracted from the European Community Household Panel reveal that in countries like the Netherlands, with the higher prevalence of part time jobs in the European Union, and Spain, with one of the lowest rate of part-time work, part-timers exhibit higher transition rates out of employment when compared to their full-time counterparts. These differences in the transition probabilities out of employment between part- and full-timers, and the subsequent persistence of non-employment episodes, are important issues that need to be taken into account when analysing the effects of maternity on female career prospects. The presence of a newborn child forces women into a position where they have to decide whether to continue at work or abandon the labour market. When the former decision is taken, they have to choose the desired number of working hours (mainly whether working part- or full-time). All these decisions can be of key relevance for women' future career path, and can be significantly affected by labour market conditions. In an

[1] Part-time jobs are more frequently found in the services sector, where wages tend to be lower than in the industry sector.

environment where the transition probabilities out of employment are significantly higher for part-timers compared to full-timers, part-time employment would, accordingly, be less attractive for those women with childcare responsibilities who desire to remain in the labour market. In such a case, the actual effectiveness of part-time employment as a way to conciliate professional and family life can be opened to further debate. This paper attempts to examine this issue in some detail, paying particular attention to how maternity affects the career prospects of female workers.

The paper is organized as follows. In the next section we provide an overview of the recent trends in part-time employment and its gender component. In Section 3 we explain the main features of an intertemporal model of fertility with endogenous selection of working hours in the presence of differences in transition probabilities to a non-employment situation. Section 4 examines some of the results obtained from the model simulation. In Section 5 we provide some empirical evidence for two countries (Spain and the Netherlands) with interesting differences in the incidence of part-time employment and in the effect of maternity on women's career path. The main conclusions of our study will be presented in Section 6.

2 Trends in part-time employment and gender component

For the last 25 years, part-time work has experienced a rapid growth in the OECD countries (O'Reilly & Fagan, 1998) to become a prominent feature of their labour markets. However, part-time work is not equally distributed across genders and age groups, nor across countries, sectors or occupations. A cross-country analysis reveals that part-time work is more widespread in northern European countries. Among them, the Netherlands has one of the highest percentage of part-time workers, with 34.8 per cent and 43.8 per cent of total employment in 1992 and 2002, respectively. In contrast, the lowest percentage of part-time employment can be found in southern European countries. In Spain, for example, part-time work represented only 6 per cent and 8 per cent of total employment in 1992 and 2003, respectively.[2] Furthermore, part-time employment is mainly female employment. In 2003, female part-time employment in the Netherlands was almost 75 per cent of total employment. A similar female predominance in part-time employment is found in Southern European countries. In 2004, according to *Mujeres en Cifras*, the periodical publication of the Women's Institute, Spanish female workers represented 81.4 per cent of the total

[2] *Part-time Work in Europe.* European Foundation for the Improvement of Living and Working Condtions, 2005.

part-time labour market. [3]

This female predominance in part-time jobs can be partially explained by the lack of sufficient care services provided by the public sector, which hinders the conciliation of family and working life (Plantenga, 1999). This shortage of care facilities makes part-time work the most suitable option for women with young children and women who are in charge of dependants and are entering or re-entering the labour market (Visser et al., 2004; Visser & Yerkes, 2005). [4]

In addition, the use of part-time work as a form of parental leave explains the impact of maternity and paternity on the working-time patterns of male and female workers.[5] In all EU-15 countries, it can be observed that when men have dependants, their working hours tend to increase, while the opposite effect can be detected amongst female workers.[6] Women tend to work on a full-time basis at the beginning of their careers, but when they have a new born child, a high number of them abandon paid work or reduce their working hours (Wetzels, 1999). In all EU-15 countries, the female partner assumes the main responsibility for domestic and care duties. [7]

Several EU Member States have used public policies and subsidies to promote the use of part-time work for female workers as a sort of parental leave, or as a way to conciliate family and work (Tobler, 1999). In this context, part-time employment can be considered as a valid instrument to combat both the decreasing tendency of fertility rates (Valdés Dal-Ré, 2000) and the high female unemployment rates, thus contributing to the achievement of higher levels of social and economic cohesion.

However, some flexible work arrangements might have a negative impact on the working conditions of certain groups of marginal workers. Most notably, if the use of part-time employment as a form of parental leave remains limited to female workers, women will become increasingly segregated on the labour market. As a result, this part-time female employment pattern can give rise to new forms of gender discrimination and become detrimental to the quality and the stability of female work. Although some actions have been taken at Community level in order to protect part-time workers from discrimination in employment and

[3] Source: *National Employment Institute* (EPA, 2004)

[4] *EUROSTAT, News Release 49/2005, 12 April 2005.*

[5] See *EC, Gender Use of Time: Three European Studies*, Office for Official Publications of the European Communities, Luxembourg, 2000 and EC, *Women at Work*, Office for Official Publications of the European Communities, Luxembourg, 1999.

[6] EUROSTAT (ALIAGA, C.), «Gender gaps in the reconciliation between work and family life», *Statistic in focus, Population and social conditions*, 4/2005.

[7] European Foundation for the Improvement of Living and Working Conditions, (Burchell, B.), *Gender, Jobs and Working Conditions in the EU*, 2002.

occupation (Directive 97/81/EC), important differences between part- and full-timers still remain in place. The reason is that the EU Directive merely recommends Member States to promote this type of employment by encouraging employers to facilitate 'as far as possible' the transition from part-time to full-time jobs and vice versa, and establish an information procedure in relation to the undertaking or establishment of vacancies. But they do not impose any obligation to act in this particular way. Consequently, as long as part-time remains predominantly a female choice and subject to strict proportionality rules, the configuration of part-time work will continue to be characterised by precariousness (Gónzalez Pérez & Rodríquez-Piñero Royo, 1998) and reflect, in general terms, a depreciation of the value of women's work performance (Borrajo Dacruz, 1978).

For this reason, it becomes increasingly important to address the question of the extent to which part-time employment can be considered an effective way to reconcile working and family life or if, by contrast, it represents an obstacle to overcome in the development of women's careers, decreasing their ability to compete in the labour market on an equal footing with men.

3 The model

The presence of children in the household has been generally regarded as one of the most important determinants of female labour supply. Since the pioneering work of Heckman (1974), many studies have pointed out that the presence of children, particularly children under six years of age, increases both the probability of women abandoning the labour market and of reducing the number of working hours (see Cleveland et al., 1996 for a list of examples). Conversely, the increase in female participation in modern economies has lead to a decline in fertility rates. Labour supply and maternity appear, therefore, to be closely interrelated decisions. Many works have provided empirical evidence for this fact. Blau and Robins (1989), for example, have pointed out that women with high levels of human capital tend to bunch their births in order to minimize the amount of time they spent out of the labour market.

This section will present a theoretical model where workers simultaneously take maternity and labour market decisions. We will then see how different labour market scenarios affect the career path of those women who decide to have a child.

In this model, worker's productivity is assumed to be determined by past labour experience or the level of human capital accumulated. More specifically, we assume that worker's

productivity in period t only depends on the amount of hours worked in period $t-1$. [8] In addition, we impose the assumption of identical hourly wages for full-time and part-time workers, that we assume to be entirely exogenous. Although empirical evidence suggests the existence of wage differences between part-, and full-timers (Ermisch and Wright, 1993; Waldfoel, 1997, among others), we impose this assumption because our analysis is mainly focused on the effect of different transition probabilities into non-employment among these two types of workers.

3.1 Firms

In each period t, firms have to decide whether to make a job offer or not, and the jobs last only one period. [9] When the job offer is accepted, the profits of a firm are given by:

$$\pi_t = \left[\alpha\left(z_{t-1}, \epsilon_t\right) - w_t\right] z_t \tag{1}$$

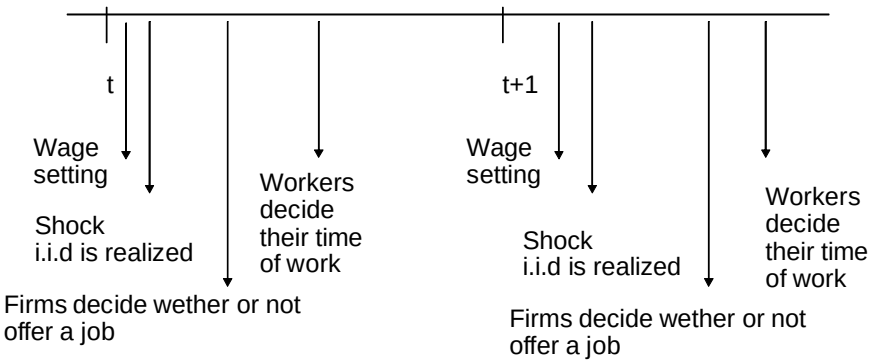
being z_t the number of hours offered by the worker, w_t the wage rate in period t. Firms are assumed to be competitive, and wages are set at the beginning of each period before the shock is realized, satisfying $E\left[\alpha\left(z_{t-1}, \epsilon_t\right) | I_{t-1}\right] = w_t$, being I_{t-1} the information set available at the end of period $t-1$. Worker's productivity, $\alpha\left(z_{t-1}, \epsilon_t\right)$[10] is assumed to be determined by human capital, which depends on the number of hours worked in the previous period and a non-negative random shock, ϵ_t, with upper bound given by Θ, that is realized before the company decides whether to offer a job or not. After the shock is realized, firms might decide not to offer a job at the wage rate set at the beginninig of the period. Once the firm has decided to offer a job, workers have to choose the number of working hours in period t, knowing that the time devoted to work in t affects firm's decision to offer a job in the next period (see Figure 1 for the timeline of job offers and working hours decisions).

[8] Any other past experience or variables are not relevant for productivity issues.

[9] For the sake of simplicity we will assume that vacant jobs have no costs.

[10] The model can be easily modified to include others variables, like education, age, etc., that might affect worker's productivity and wages.

Figure 1: Job offers and workers worktime decisions timeline



The firm will offer a job, after the realization of the random shock, as long as $\pi_t > c$, being c, the cost of a vacant job which we have assumed to be zero. Thus, a job will be offered when $\alpha(z_{t-1}, \epsilon_t) > w_t$. However, due to the presence of stochastic shock, ex ante, the likelihood that the company offered a job is given by $P[\alpha(z_{t-1}, \epsilon_t) > w_t]$. We assume a probability distribution function, $G(.)$, satisfying the following properties:

i).$E[\alpha(z_{t-1}, \epsilon_t)|I_{t-1}] = w_t$ is accomplished for every possible value of z_{t-1}, or alternatively:

$$\int_0^{\Theta} \left\{ G\left[\alpha\left(z_{t-1} = z^{FT}, \epsilon_t\right)\right] - G\left[\alpha\left(z_{t-1} = z^{PT}, \epsilon_t\right)\right] \right\} d\epsilon = 0 \tag{2}$$

$$\int_0^{\Theta} \left\{ G\left[\alpha\left(z_{t-1} = z^{PT}, \epsilon_t\right)\right] - G\left[\alpha\left(z_{t-1} = 0, \epsilon_t\right)\right] \right\} d\epsilon = 0 \tag{3}$$

ii).Single crossing property: There exists a parameter φ, with $0 < \varphi < \Theta$, such that:

$$G\left[\alpha\left(z_{t-1} = z^{FT}, \epsilon_t\right)\right] - G\left[\alpha\left(z_{t-1} = z^{PT}, \epsilon_t\right)\right] \geq 0 (\leq 0) \text{ when } \epsilon_t \leq \varphi (> \varphi) \tag{4}$$

$$G\left[\alpha\left(z_{t-1} = z^{PT}, \epsilon_t\right)\right] - G\left[\alpha\left(z_{t-1} = 0, \epsilon_t\right)\right] \geq 0 (\leq 0) \text{ when } \epsilon_t \leq \varphi (> \varphi) \tag{5}$$

iii).There exists a θ, with $0 < \theta < \Theta$, such that:

$$\int_0^{\theta} \left\{ G\left[\alpha\left(z_{t-1} = z^{FT}, \epsilon_t\right)\right] - G\left[\alpha\left(z_{t-1} = z^{PT}, \epsilon_t\right)\right] \right\} d\epsilon \geq 0 \tag{6}$$

$$\int_0^{\theta} \left\{ G\left[\alpha\left(z_{t-1} = z^{PT}, \epsilon_t\right)\right] - G\left[\alpha\left(z_{t-1} = 0, \epsilon_t\right)\right] \right\} d\epsilon \geq 0 \tag{7}$$

$iv).\varphi \leq w_t$.

Conditions $i) - iii)$ define $G\left[\alpha\left(z_{t-1} = z^{FT}, \epsilon_t\right)\right]$ and $G\left[\alpha\left(z_{t-1} = z^{PT}, \epsilon_t\right)\right]$ as a mean preserving increase in spread of $G\left[\alpha\left(z_{t-1} = 0, \epsilon_t\right)\right]$. This implies a shift of the probability mass to the tails of the distribution while keeping the mean unchanged, making ex ante more profitable for a firm to offer a job to a worker with a higher level of past experience, since from $iv)$ it follows:

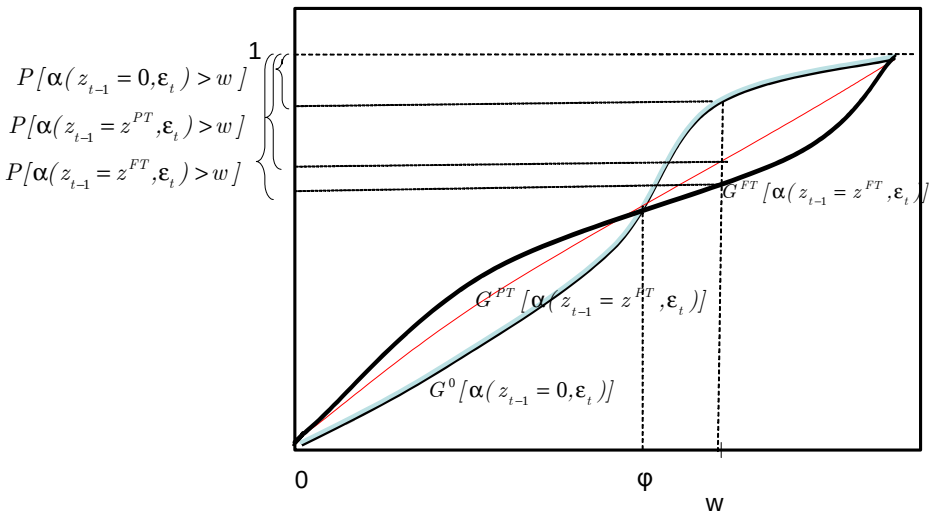
$$G\left[\alpha\left(z_{t-1} = z^{FT}, \epsilon_t\right) \leq w_t\right] < G\left[\alpha\left(z_{t-1} = z^{PT}, \epsilon_t\right) \leq w_t\right] < G\left[\alpha\left(z_{t-1} = 0, \epsilon_t\right) \leq w_t\right] \tag{8}$$

Alternatively, and since $P\left[\alpha\left(z_{t-1}, \epsilon_t\right) > w_t\right] = 1 - G\left[\alpha\left(z_{t-1}, \epsilon_t\right)\right]$, then:

$$P\left[\alpha\left(z_{t-1} = z^{FT}, \epsilon_t\right) > w_t\right] > P\left[\alpha\left(z_{t-1} = z^{PT}, \epsilon_t\right) > w_t\right] < P\left[\alpha\left(z_{t-1} = 0, \epsilon_t\right) > w_t\right] \tag{9}$$

or in compact terms, $p_{FT} \geq p_{PT} \geq p_{NJ}$.

Figure 2: Probability Distribution functions of workers productivity

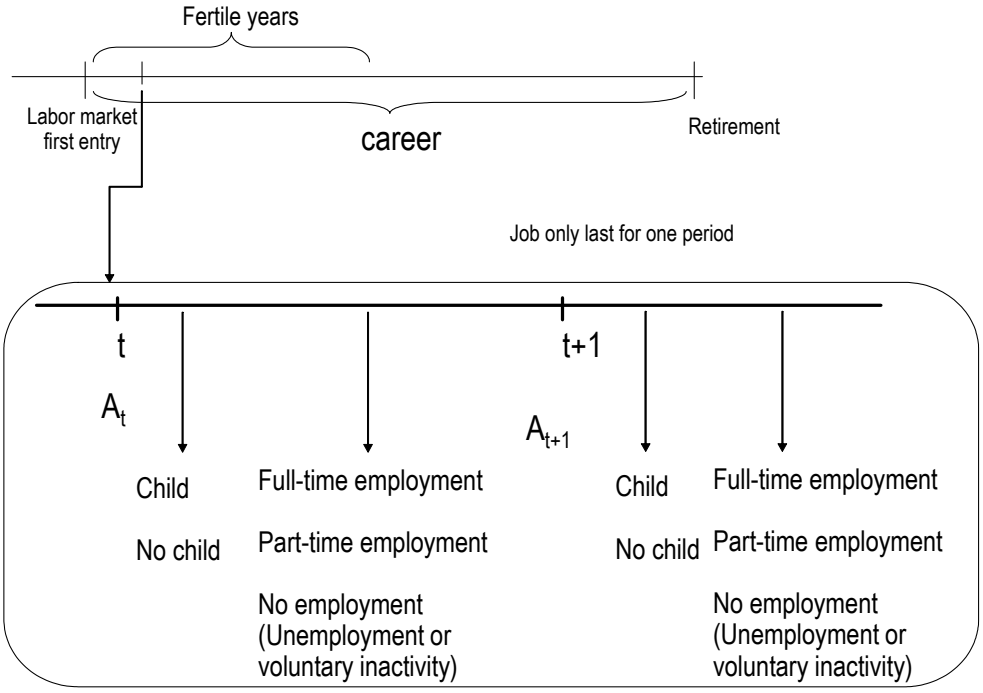


In other words, before the stochastic shock is realized, the probability that a job would be offered by the firm when the agent worked full time at previous period is greater than when he/she worked part-time, and at the same time higher than when the agent decided not to work.

3.2 Workers

The agent, who live only a finite amount of time, aims to maximize her intertemporal utility, discounting future utility flows at a rate r, ($\beta = 1/(1+r)$). This optimization problem involves several decisions, represented in Figure 3.

Figure 3: Maternity and working hours decisions



Maternity decision

The decision of having a child is added, as a separable term (B), into the welfare function of the representative household.[11] If the agent decides to have a baby her welfare increases in B, but in turn she must afford a minimum level of « child care », $y_t \geq y_t^*$. This child

[11] For the sake of simplicity, we assume that the direct utility given by the decision of having a child is exogenous and fixed, but it can be random or deterministic or can depend on variables like age, labour stability, household dwelling tenure, etc.

care good can be produced internally or bought in the market at a price p. B can be thought as the utility level reached by the child when he/she consumes y_t^* , being y_t^* the level of consumption that maximizes child utility, which is exogenously given.[12] Following the empirical evidence (Ribar, 1995), we will assume that childcare expenditures, py_t^*, are fixed with respect to the number of hours worked.

This minimum level, y_t^*, can be thought of as a function that depends on several variables, such as child number, child age (for instance, new-borns need more intensive care), socioeconomic status, etc. Imposing that the amount of child care must reach at least a minimum level may lead to changes in optimal allocations depending on whether such minimum acts as an active or binding constraint. As mentioned before, several studies have shown that the level of childcare decreases with the age of the child (see table 1 for the case of Spain). This feature is introduced in our model by imposing the condition, $y_\tau^* > y_{\tau+1}^*$, being τ any period of time after the decision of having a child has been made. For model simulation purposes we assume that childcare needs decrease exponentially with time.[13]

Table 1.- Weekly hours devoted to childcare

	Child under 2 years	Child 3-5 years	Child 6-9 years
Total time (hours: minutes)			
Avaliabability of domestic service			
With domestic service	36 : 45	16 : 48	16 : 34
Without domestic service	27 : 27	14 : 24	15 : 10
Income (monthly)			
Less than 1,000 €	22 : 22	13 : 38	18 : 17
1,000- 1,499 €	24 : 46	13 : 17	14 : 24
1,500-1,999 €	28 : 18	14 : 58	17 : 00
2,000 and more	35 : 18	16 : 45	14 : 37
Source: Spanish National Institute. Survey on Use of Time 2002-2003.			

[12] Under this view, and assuming separability in the parents utility function, the female welfare can be re expressed as:

$$U\left(c,l,I_bU^c\left(y^*\right)\right)=U\left(c,l\right)+I_bU\left[U^c\left(y^*\right)\right]=U\left(c,l\right)+I_bB$$

where I_b is a variable that takes value 1 when the couple decides to have a child, and 0 otherwise. This formulation is very similar to Hamilton "extended fitness" developed in Biology (see Bergstrom,1996). For simulation purposes, utility function is given by: $U\left(c,l\right)=\log\left(c\right)+\alpha\log\left(l\right)$

[13] Given the scarcity of data, any other decreasing function can be also considered.

Childcare can be bought, either by hiring domestic service personnel, by taking children to a kindergarten, or it can be internally produced. Assuming that agents have a total amount of time normalized to one, devoting $0 < h < 1$ units of time to home production would produce $F(h)$units of childcare good. The home production function, $F(h)$, will be such that $F(h_{\max}) > y_1^*$, so that there exists the possibility that childcare could be entirely covered by home production. [14]In addition, we impose a "non market" constraint in household production, so that any excess of home production can not be sold to the market. This would imply that $F(h) \leq y_t^*$, reflecting the fact that women who quit the labour market to take care of their children usually do not care for other's children, and do not open their own kindergarten.

.

Working hours decision

In our model we assume that the working hours decision is restricted to three possible employment situations. In particular, we consider that the agent can choose between three possible labour market states: *i*) full-time employment, which excludes the possibility of home production, *ii*) part-time employment, together with home production, and *iii*) non-employment, devoting all the non-leisure time to home production.[15] As mentioned above, the choice made by the agent regarding the number of working hours affects the likelihood of receiving a job offer in the next period. In order to incorporate this assumption into our model, we consider that $p_{FT} \geq p_{PT} \geq p_{NJ}$, being $p_j(j$ =full-time(FT), part-time (PT), non-employment $(NJ))$ the probability of receiving a job offer for the next period to be conditional on the initial labour market state. After receiving a job offer, the agent must decide whether to reject or accept it. In the first case, the agent would be in non-employment in the next period, while in the second case he/she has also to decide the amount of working hours. Finally, with probability $(1 - p_j$) the agent does not receive any job offer, so the only option for the next period is to be involuntarily unemployed.

Since the amount of total disposable time is finite and normalized to unity, the choice of working hours and hours devoted to home production are clearly related by the constraint, $1 = z + h + l$, being, z the working time, h time devoted to home production and, l leisure time. For the sake of simplicity, we consider only a finite number of feasible combinations between the time devoted to these non leisure activities, imposing a minimum level of leisure

[14]In the simulations the home production function we consider have constant productivity: $y = F(h) = Ah$

[15]In principle we do not distinguish between voluntary and involuntary unemployment.

equal to 0.2 time units (see Table 2)[16].

The agent must decide in every period how much time she wish to work, z, how much time to devote to childcare activities, h, and which portion of her rent wants to save, A_t, in two alternative "states": when she has decided to have a child, and when she has not. Given the recursive nature of this problem, this finite horizon intertemporal optimization program can be expressed in terms of Bellman equations with termination value equal to zero (we assume that there is not bequest motive). [17]

Table 2: Feasible time allocation

Children in the household			
	Household production time		
Working hours	0	$h^{PT}= 0.4$	$h^{FT}= 0.8$
0			Non employment
$z^{PT}= 0.4$		Part-time	
$z^{FT}= 0.8$	Full-time		
No children in the household			
	Household production time		
Working hours	0	$h^{PT}= 0.4$	$h^{FT}= 0.8$
0	Non employment		
$z^{PT}= 0.4$	Part-time		
$z^{FT}= 0.8$	Full-time		

We can write the Bellman equations for the six possible "states" resulting from the combination of maternity and working hours decisions, plus the correspondent resource constraint (in addition with the "non market" constraint $F(h_t) \leq y_t^*$) as follows:

- "Child and full-time employment state:

$$V_t^{C,FT}(A_t) = \max\{U\left(c_t, 1 - z^{FT}\right) + B + \beta p_{FT} V_{t+1}^{C,TJ^*}(A_{t+1}) + \beta\left(1 - p_{FT}\right) V_{t+1}^{C,NJ}(A_{t+1})\} \tag{10}$$

s.t

$$c_t + A_{t+1} = z^{FT} w_t + (1 + r) A_t - p y_c \tag{11}$$

[16] This implies that maximum amount of time devoted to either home production, $h_{\max}$, or work, $z_{\max}$, will be 0.8

[17] The state variables of this optimization problem are the wealth level, the number of working hours and the fact of having or not having a child.

- "Child and part-time employment state:

$$V_t^{C,PT}(A_t) = \max\{U\left(c_t, 1-h^{PT}-z^{PT}\right)+B+\beta p_{PT} V_{t+1}^{C,TJ^*}(A_{t+1})+\beta(1-p_{PT})V_{t+1}^{C,NJ}(A_{t+1})\} \tag{12}$$

s.t

$$c_t + A_{t+1} = z^{PT} w_t + (1+r)A_t - p\left(y_c - F\left(h^{PT}\right)\right) \tag{13}$$

- "Child and non-employment state:

$$V_t^{C,NJ}(A_t) = \max\{U\left(c_t, 1-h^{FT}\right)+B+\beta p_{NJ} V_{t+1}^{C,TJ^*}(A_{t+1})+\beta(1-p_{NJ})V_{t+1}^{C,NJ}(A_{t+1})\} \tag{14}$$

s.t

$$c_t + A_{t+1} = z^{FT} w_t + (1+r)A_t - p\left(y_c - F\left(h^{FT}\right)\right) \tag{15}$$

- "No child and full-time employment state:

$$\begin{aligned} V_t^{NC,FT}(A_t) &= \max\{U\left(c_t, 1-z^{FT}\right) + \beta p_{FT}\max\{V_{t+1}^{C,TJ^*}(A_{t+1}), V_{t+1}^{NC,TJ^*}(A_{t+1})\} \\ &\quad +\beta(1-p_{FT})\max\{V_{t+1}^{C,NJ}(A_{t+1}), V_{t+1}^{NC,NJ}(A_{t+1})\}\} \end{aligned} \tag{16}$$

s.t

$$c_t + A_{t+1} = z^{FT} w_t + (1+r)A_t \tag{17}$$

- "No child and part-time employment state:

$$\begin{aligned} V_t^{NC,PT}(A_t) &= \max\{U\left(c_t, 1-z^{PT}\right) + \beta p_{PT}\max\{V_{t+1}^{C,TJ^*}(A_{t+1}), V_{t+1}^{NC,TJ^*}(A_{t+1})\} \\ &\quad +\beta(1-p_{PT})\max\{V_{t+1}^{C,NJ}(A_{t+1}), V_{t+1}^{NC,NJ}(A_{t+1})\}\} \end{aligned} \tag{18}$$

s.t

$$c_t + A_{t+1} = z^{PT} w_t + (1+r)A_t \tag{19}$$

- "No child and non-employment state:

$$\begin{aligned} V_t^{NC,NJ}(A_t) &= \max\{U(c_t, 1) + \beta p_{NJ}\max\{V_{t+1}^{C,TJ^*}(A_{t+1}), V_{t+1}^{NC,TJ^*}(A_{t+1})\} \\ &\quad +\beta(1-p_{NJ})\max\{V_{t+1}^{C,NJ}(A_{t+1}), V_{t+1}^{NC,NJ}(A_{t+1})\}\} \end{aligned} \tag{20}$$

s.t

$$c_t + A_{t+1} = (1+r)A_t \tag{21}$$

where

$V^{C,j}(A_t)$, value function for "child and j-employment state, being $j = FT, PT, NJ$

$V^{NC,j}(A_t)$, value function for "no child and j-employment state, being $j = FT, PT, NJ$

and,

$$V^{C}(A_t, TJ^*) = \max\{V^{C,FT}(A_t), V^{C,PT}(A_t), V^{C,NJ}(A_t)$$

$$V^{NC}(A_t, TJ^{**}) = \max\{V^{NC,FT}(A_t), V^{NC,PT}(A_t), V^{NC,NJ}(A_t)$$

As it can be seen, the model presented in this paper belongs to the general class of "optimal stopping" models. The decision of having a child is optimal whenever $V^{C}(A_t, TJ^*) > V^{NC}(A_t, TJ^{**})$, being TJ^* the optimal number of working hours given "child" or "no child" decision.

4 Simulation results

Numerical simulations of the model are based on the assumption that the agent has not children at time $t = 0$ and that she must decide whether to have a child or not, considering a temporal horizon of $T = 50$periods.[18] Maternity decision implies to consider the optimal path of working hours subject to childcare needs, employment transition probabilities and initial wealth. The values of the parameters used in the simulations are calibrated in order to make working full time the preferred option when household is in "no child state".

Since our aim is to analyse the transition probabilities out of employment, we assume that the choice of working hours does not affect the wage rate, although the model could be easily modified to include this feature.

For the numerical simulation in the "child" state, we use values of wages and childcare costs such that home production of all childcare services is the optimal decision in early stage of maternity (when childcare needs are more time intensive). Since these needs are decreasing over time, the decision of abandoning the labour market is only temporary, and the agent will subsequently re-enter it buying the childcare services in the market if needed.

In order to disentangle the effect of differences in the risk of non-employment, we simulate two scenarios which differ only in the transition probabilities out of employment. In the first scenario, we assume equal probabilities irrespective of previous labour state (full time, part time or unemployment). In the second one, we assume that these probabilities vary inversely with the number of working hours. In other terms, we assume that $p_{FT} \geq p_{PT} \geq p_{NJ}$.

[18] Timeline decisions are of the form of Figure 3.

Numerical simulations reveal that a higher transition rate to non-employment among part-timers in comparisons with full-timers makes maternity less attractive, particularly when the initial amount of wealth is relatively low. From these results, it clearly appears that in our model the higher risk of unemployment associated to part-time contracts disincentives maternity, since full-time positions are preferred in order to avoid undesired episodes of non-employment.

These differences in probabilities do not only disincentive maternity, but also induce changes on the desired temporal path of employment types when the agent decides to have a child. As it can be seen in Figure 4, when transition probabilities to non-employment are higher in part-time positions, the period spent out of the labour market immediately after having a child becomes shorter. Similarly, the subsequent time spent in part-time employment is also reduced.

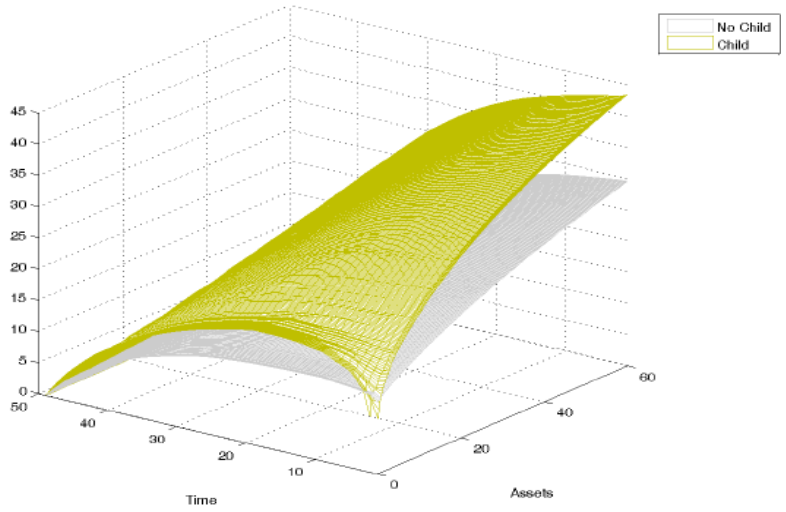
The implications of these results are particularly evident. Reducing the desired number of working hours or leaving the job market, when having a child, may increase in some cases the risk of being in a non-employment situation. In such a case, women might have less incentives to have children, especially when they want to remain in the labour market, since the option of a part-time job as a way to conciliate maternity and working life implies higher difficulties to re-enter full-time employment once the highly intensive initial childcare period finishes.

Figure 4: Value functions

$(U(c,l) = \log(c) + \alpha \log(l);\ \alpha = 1;\ B = 1;\ p = 1;\ y_t^* = 1 + 2e^{-0.1t};\ y = \frac{3}{0.8}h;\ r = 0.5;$
$A = [0, 60];\ w = 3)$

Scenario 1: Equal probabilities irrespective of time of job

$(p_{FT} = p_{PT} = p_{NJ} = 0.9)$



Scenario 2: Unequal probabilities

$(p_{FT}(0.9) \geq p_{PT}(0.7) \geq p_{NJ} = 0.4)$

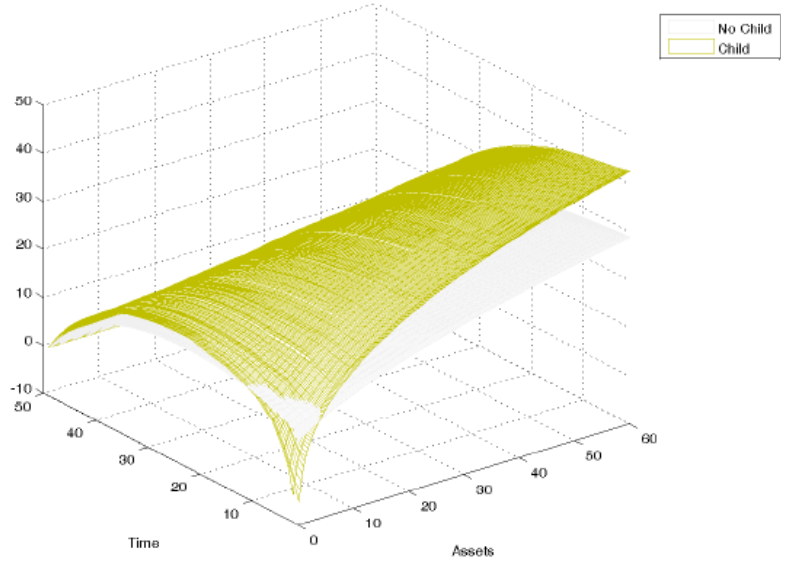
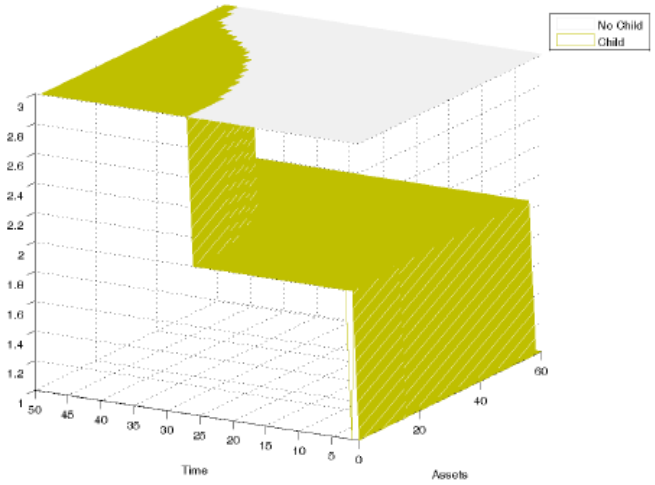


Figure 5: Working hours (1 no work; 2 part-time; 3 full-time)

$(U(c,l) = \log(c) + \alpha \log(l);\ \alpha = 1;\ B = 1;\ p = 1;\ y_t^* = 1 + 2e^{-0.1t};\ y = \frac{3}{0.8}h;\ r = 0.5;$
$A = [0, 60];\ w = 3)$

Scenario 1: Equal probabilities irrespective of time of job

$(p_{FT} = p_{PT} = p_{NJ} = 0.9)$



Scenario 2: Unequal probabilities

$(p_{FT}(0.9) \geq p_{PT}(0.7) \geq p_{NJ} = 0.4)$

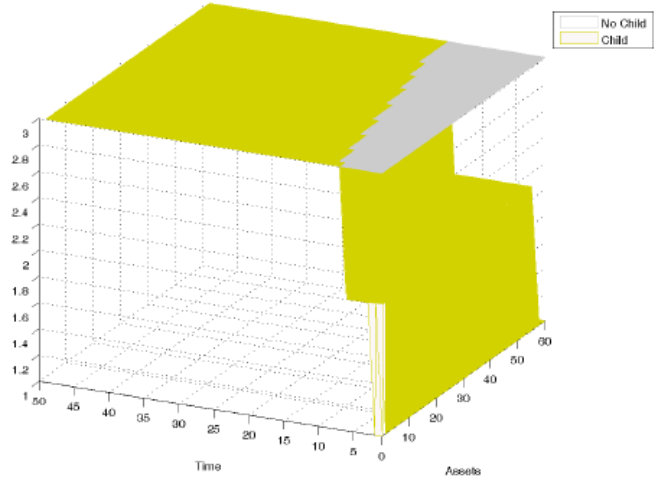
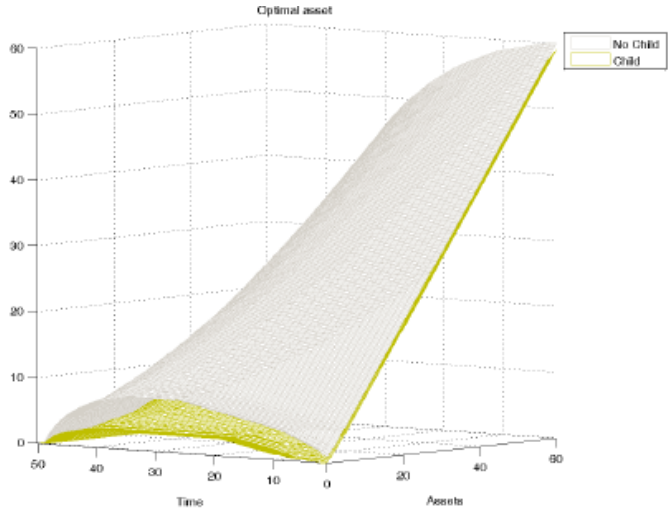


Figure 6: Optimal asset accumulation

$(U(c,l) = \log(c) + \alpha \log(l);\ \alpha = 1;\ B = 1;\ p = 1;\ y_t^* = 1 + 2e^{-0.1t};\ y = \frac{3}{0.8}h;\ r = 0.5;$
$A = [0, 60];\ w = 3)$

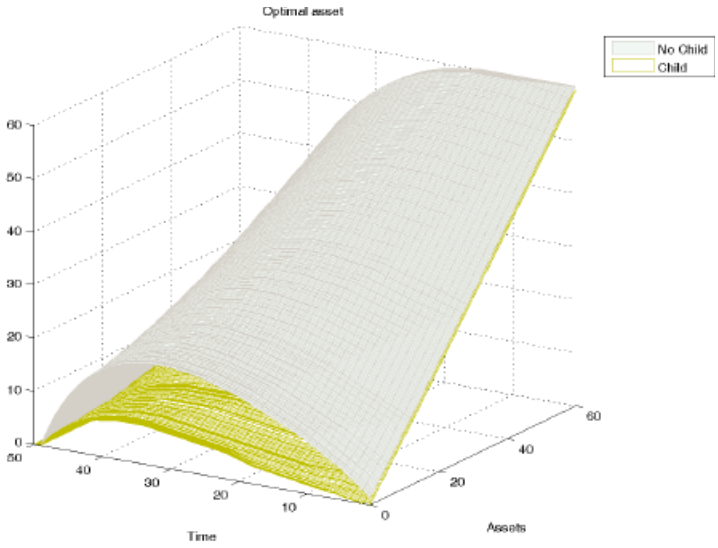
Scenario 1: Equal probabilities irrespective of time of job

$(p_{FT} = p_{PT} = p_{NJ} = 0.9)$



Scenario 2: Unequal probabilities

$(p_{FT}(0.9) \geq p_{PT}(0.7) \geq p_{NJ} = 0.4)$



5 Empirical evidence

This section is intended to provide empirical evidence on the relationship between childcare activities and the choice of working hours, and the implications for female working careers. Since the later implies a dynamic analysis, we use longitudinal data extracted from the European Community Household Panel (ECHP, 1995-2001). More particularly, this analysis focuses on two countries which present a marked contrast in terms of the incidence of part-time employment: Spain and the Netherlands. For our purposes, we have selected a sample of females aged between 20 and 45 years old, living as a couple and who are either in an employment or non-employment situation at time $t$and $t+1$.[19]

Among those women in employment at t, we distinguish between full- and part-timers. An important issue, therefore, is how to define part-time work. According to the definition proposed by the ILO, part-time work is regular employment in which working time is substantially less than normal. The same idea is expressed in the European Framework Agreement on part-time work, which was signed by the European social partners in 1997. The range of cut-offs used in some countries to distinguish between full- and part-time employment and the existence in other countries of definitions based on assessment by the respondent have given rise to the issue of the comparability of the estimates obtained from these various definitions. A special report for the OECD on the classification of part-time work (van Bastelaer et al., 1997) argued that setting 30 hours as a threshold would lead to a better definition of part-time work for the purposes of international comparisons. We have accordingly considered as part-timers those persons whose weekly working hours are below this 30 hours threshold.

Table 3 shows the incidence of part-time employment among female workers aged 20 and 45 years in both countries.

Table 3: Incidence of part-time employment over total people in employment

	Females 20-45	All workers 16-64	Workers other than females 20-45
Spain	20.99	8.11	4.46
The Netherlands	68.63	30.64	18.32

As it can be observed, in both countries, part-time employment is mainly female employment, although the incidence of this form of employment is significantly higher in the

[19] We only consider wage and salary female workers. Furthermore, non-employment includes both unemployment and inactivity.

Netherlands. To some extent, the differences between these two countries can be largely attributed to the fact that in the Netherlands part-time employment is mostly a voluntary choice, while this is not the case in Spain. In Table 4, however, we can observe that in both countries part-time employment seems to be a voluntary choice for a high proportion of women with childcare responsibilities.

Table 4: Reasons for working part-time (Females 20-45 years)

	All females		Females with children under 12	
	Spain	The Netherlands	Spain	The Netherlands
Education and training	1, 67	1, 67	0, 39	0, 41
Looking after children	43, 13	72, 17	53, 71	86, 73
Illness or dissability	0, 48	1, 23		0, 46
Cannot find full-time	26, 64	4, 91	22, 27	2, 49
Not want to work more	6, 81	15, 55	5, 27	7, 47
Other reasons	21, 27	4, 47	18, 36	2, 44

Despite this clear preference for part-time work among women with childcare responsibilities, the incidence of this form of employment is considerably lower in Spain. This lower incidence can, to some extent, be attributed to the existing differences in the transition rates to a non-employment situation between part- and full-timers. In order to account for these differences we estimate a trivariate probit model. We denote e_{it}^{*} the probability of employment at t, that can be expressed as follows:

$$e_{it}^{*} = \beta^{'} z_{it} + \epsilon_{it}, \quad \epsilon_{it} \sim N\left(0, 1\right) \tag{22}$$

Let E_{it} be a dummy variable indicating whether the individual i is employed in year t:

$$E_{it} = \begin{cases} 1 & \text{if } e_{it}^{*} > 0 \\ 0 & \text{if } e_{it}^{*} \leq 0 \end{cases}$$

For those individuals employed in year t, we can observe their working hours. Let us assume that the choice of working hours in year t is specified according to the following equation:

$$f\left(h_{it}\right) = \gamma^{'} m_{it} + u_{it}, \quad u_{it} \sim N\left(0, 1\right)$$

Considering τ_t as the part-time threshold for year t, established as 30 hours per week, the probability of being in part-time employment at t can be expressed through the following equation:

$$p_{it}^{*} = \delta^{'} m_{it} + v_{it}, \quad v_{it} \sim N(0,1) \tag{23}$$

where $p_{it}^{*} \equiv f(\tau_t) - f(h_{it})$ and $v_{it} \equiv -u_{it}$. We define the part-time indicator P_{it} as follows:

$$P_{it} = \begin{cases} 1 & \text{if } p_{it}^{*} > 0 \\ 0 & \text{if } p_{it}^{*} \leq 0 \end{cases}$$

For year $t+1$, we have the following expression for the chance of employment:

$$e_{it+1}^{*} = E_{it}\left(\lambda_1^{'} j_{1it} + \theta_e P_{it}\right) + (1 - E_{it})\,\lambda_2^{'} j_{2it} + \varpi_{it+1}, \quad \varpi_{it+1} \sim N(0,1) \tag{24}$$

where the vector j_{1it} contains all the personal characteristics in j_{2it} plus some job attributes. Finally, we define the employment indicator variable E_{it+1} as follows:

$$E_{it+1} = \begin{cases} 1 & \text{if } e_{it+1}^{*} > 0 \\ 0 & \text{if } e_{it+1}^{*} \leq 0 \end{cases}$$

In addition, we assume that the unobservable factors in equations $(22) - (24)$ are jointly distributed as four-variate normal with zero means, unit variances, and unrestricted correlations:

$$(\epsilon_{it}, v_{it}, \varpi_{it+1}) \sim N_3(0,1)$$

The trivariate probit model is estimated by maximum likelihood for the two countries mentioned above, using pooling annual transitions from the ECHP (1995-2001). The likelihood function involves normal integrals of various dimensions, the largest being three. The estimation of the model requires, therefore, the evaluation of multivariate normal probability distribution functions. In order to solve this computational problem, we use the Geweke-Hajivassiliou-Keane (GHK) simulator.[20] As we have repeated observations for individuals making more than one transition and, as a result, the i.i.d assumption is violated, we have used a Pseudo Simulated Maximum Likelihood (PSML) estimator.

We make use of personal and family characteristics as explanatory variables for the employment chances at t (age, level of education, level of education of the partner, a dummy indicating there are children between 12 and 15 years in the household, a dummy indicating whether the individual suffer some type of illness or disability, and a dummy to indicate there is a newborn child in the household). We also include in the part-time equations both

[20] The GHK simulator works by taking draws from upper truncated univariate standard normal distributions, and then recursively computing a multivariate probability value using Cholesky factorization.

personal (age, level of education, level of education of the partner, a dummy indicating there is a newborn child in the household) and job characteristics (a dummy indicating whether there is child-minding or crèche provided by the employer – free or subsidized - , occupation and activity dummies). Finally, in the employment equation at $t+1$, apart from the explanatory variables included in the employment equation at t, two dummy variables indicating whether the individual was in part-, or full-time employment at t are also included, thus taking those in non-employment as the reference group. The estimation results are reported in Table 5. [21]

In both countries, as it can be observed, maternity decisions have a marked impact on labour market decisions. More particularly, the results clearly reveal that having a child significantly reduces the probability of employment one year after child birth, although this effect is slightly higher in Spain, where a woman having a child exhibits a probability of employment in the next period 1.72 times higher than the corresponding to a woman without a new born child. The main country differences are found in the effect of previous labour-market state. Although in both countries being initially employed, either part- or full-time, increases the chances of remaining employed one year later, significant differences can be appreciated in the case of Spain between part- and full-time employment. If we take, for example, women who were in a non-employment situation as the reference, those in part-time exhibit a probability of being employed one year later 2.349 times higher, while the corresponding number among those initially in full-time is 3.104. In the case of the Netherlands, by contrast, differences between part- and full-time employment are almost insignificant.

To certain extent, these different probabilities observed in the two countries might serve to explain the existing differences in the use of part-time employment as a way to conciliate personal and working life. The higher risk of becoming unemployed observed amongst Spanish female part-timers would make this form of employment less attractive for those women who decide to have a child but also want to remain in the labour market. The questionable effectiveness of part-time work in this respect might also help to explain the lower fertility rates observed amongst Spanish women in comparison with their Dutch counterparts.

[21] Estimation results of employment chances and part-time at t reported in the Appendix 2.

Table 5: Probability of being employed (t+1)				
	Spain		Netherlands	
	Odd ratio	t	Odd ratio	t
Age				
20-29				
30-35	1,033	0,42	1,064	0,67
36-45	1,056	0,80	0,986	−0,18
Education				
Primary				
Secondary	1,312	4,13	1,407	3,36
Tertiary	1,853	7,43	1,887	5,49
Education of the partner				
Primary				
Secondary	0,983	−0,24	0,884	−1,01
Tertiary	1,011	0,14	0,904	−0,77
New born child	0,582	−3,53	0,673	−2,80
Children 12-15 in the household	1,152	2,57	1,250	3,49
N^o members in the household	0,950	−1,74	0,928	−2,03
Disability	0,844	−1,56	0,576	−6,81
Partner in low-wage employment	1,054	0,67	1,167	1,29
Labour situation at t				
Unemployed or inactive				
Part-time employment	2,349	3,60	2,620	6,69
Full-time employment	3,104	10,48	2,572	6,71
N	7286		5074	
Log pseudolikelihood	−7484		−5690	

6 Conclusions

For the last few years, part-time employment has been generally considered to be an appropriate instrument to conciliate professional and familiar life. However, the empirical evidence shows that part-time work is not equally distributed across gender and age groups, nor across countries, sectors or occupations. Furthermore, part-time workers are very often at a disadvantage in terms of wages, quality of positions, career prospects, etc. when

compared to their full time counterparts.

Although primarily intended to promote the conciliation of professional and family life , the spread of part-time work has also given rise to new forms of gender discrimination and become detrimental for the attainment of employment quality and job stability, especially for the female collective. As a result, this form of employment may have become less attractive for women with child care responsibilities. This would explain why in some countries full-time employment continues to be the preferred option for women who want to remain in the labour market.

In this paper we have focused on the effects on female career prospects of the existence of differences in the transition rates into unemployment between part and full-timers and the subsequent persistence of unemployment episodes. Motherhood imposes on women the decision whether they want to continue or leave the labour market. When the former decision is taken, women would have to decide if they opt for a part- or full-time employment. All these decisions can be of paramount importance for women' future career path, and can also be significantly affected by existing labour-market conditions. In an environment where transition probabilities out of employment are significantly higher for part-timers when compared to full-timers, there is little doubt that part-time employment would be perceived as inherently less attractive.

An empirical analysis of Spain and the Netherlands reveals significant country differences in employment probabilities depending on the previous labour-market situation. More particularly, there is clear evidence that in Spain female part-timers are significantly less likely to be employed one year later than full-timers, while this is not the case for the Netherlands. These differences in probabilities may partially serve to explain why part-time employment is less preferred among Spanish women with childcare responsibilities when compared with their Dutch counterparts. Likewise, the higher risk of becoming unemployed observed amongst Spanish female part-timers can make this form of employment less attractive for those women who decide to have a child but also want to remain in the labour market.

Apendix 1

The numerical solution of the finite horizon model presented in this paper is obtained by backward-solving the Bellman equation on a discretized state space with terminal value equal to zero[22]. Numerical simulations of the model are done by assuming that the agent has not children at time $t = 0$ and considering a temporal horizon of $T = 50$ periods.

We compare two alternatives value functions at time $t = 0$ given by the Bellman equations when the agent has decided to have a child and when she has decided not to have a child in her entire working life. In each case there are two decision variables: savings, A,and working hours, z. Savings are discretized as a 300 points linear grid equally spaced over the interval $A = [0, 60]$. We consider that working time has only three possible values, $z = [0.8, 0.4, 0]$, which correspond with the three situations analysed in the paper "full time job" "part time job" and "no job".

The backward solving method involves the following steps for each of the possible "child" states:

A) Child State

1).For $t = 50$, being $i = j = 1, ..., 300$ the possible values of A

$$V_t^{C,FT}(A_i) = V_t^{C,PT}(A_i) = V_t^{C,NJ}(A_i) = V_t^{C,TJ^*}(A_i) = 0 \tag{25}$$

where $V_t^{C,FT}(A_i)$, $V_t^{C,PT}(A_i)$ and $V_t^{C,NJ}(A_i)$ are the value functions for "child" and "full-time", "part-time" and "no job" states respectively.

2). For $t = [1, 2, ..., 49]$ and $z^{FT} = 0.8$, $z^{PT} = 0.4$, we compute the value functions for the three possible values of working time ("full-time", "part-time" and "no job") as follows[23]:

Full-time:

$$V_t^{C,FT}(A_i) = \max_{A_j} \left\{ U\left(c_t, 1 - z^{FT}\right) + B + \beta p_{FT} V_{t+1}^{C,TJ^*}(A_j) + \beta\left(1 - p_{FT}\right) V_{t+1}^{C,NJ}(A_j) \right\} \tag{26}$$

with,

$$c_t = z^{FT} w_t + (1 + r) A_i - p y_{*t} - A_j \tag{27}$$

[22] For more details see Judd (1998) or Ljungqvist and Sargent (2004).

[23] If at any point in time, $py_t^* - pF(z) < 0$, then z is recalculated to match exactly with y_t^* as $z' = F^{-1}(y_t^*)$ and the difference $z - z'$ is directly added to the utility function as more leisure time.

Part-time:

$$V_t^{C,PT}(A_i) = \max_{A_j} \left\{ U\left(c_t, 1 - z^{PT}\right) + B + \beta p_{PT} V_{t+1}^{C,TJ^*}(A_j) + \beta\left(1 - p_{PT}\right) V_{t+1}^{C,NJ}(A_j) \right\} \tag{28}$$

with,

$$c_t = z^{PT} w_t + (1 + r) A_i - p\left(y_{*t} - F(0.4)\right) - A_j \tag{29}$$

No Job:

$$V_t^{C,NJ}(A_i) = \max_{A_j} \left\{ U(c_t, 0.2) + B + \beta p_{NJ} V_{t+1}^{C,TJ^*}(A_j) + \beta\left(1 - p_{NJ}\right) V_{t+1}^{C,NJ}(A_j) \right\} \tag{30}$$

with,

$$c_t = (1 + r) A_i - p\left(y_{*t} - F(0.8)\right) - A_j \tag{31}$$

In every period and for the three possible employment states, the optimal saving decisions, $A_j^{C,FT}$, $A_j^{C,PT}$ and $A_j^{C,NJ}$, are retained.

3).We compute the optimal amount of working hours by:

$$V_t^{C,TJ^*}(A_i) = \max\left\{ V_t^{C,FT}(A_i), V_t^{C,PT}(A_i), V_t^{C,NJ}(A_i) \right\} \tag{32}$$

and for every period t, the optimal number of working hours is retained in an index vector TJ^*.

4). We go back to step 2) and repeat until $t = 0$.

Once the optimal number of working hours is determined for $t = 1, ..., 50$, the complete history of working hours and optimal savings can be recovered from TJ^* and $A_j^{C,FT}$, $A_j^{C,PT}$ and $A_j^{C,NJ}$.

B) No Child State

1).For $t = 50$, being $i = j = 1, ..., 300$ the possible values of A

$$V_t^{NC,FT}(A_i) = V_t^{NC,PT}(A_i) = V_t^{NC,NJ}(A_i) = V_t^{NC,TJ^*}(A_i) = 0 \tag{33}$$

where $V_t^{NC,FT}(A_i)$, $V_t^{NC,PT}(A_i)$ and $V_t^{NC,NJ}(A_i)$ are the value functions for "no child" and "full-time", "part-time" and "no job" states respectively.

2). For $t = [1, 2, ..., 49]$ and $z^{FT} = 0.8$, $z^{PT} = 0.4$, we compute the value functions for the three possible values of working time ("full-time", "part-time" and "no job") as follows:

Full-time:

$$V_t^{NC,FT}(A_i) = \max_{A_j} \left\{ U\left(c_t, 1 - z^{FT}\right) + \beta p_{FT} V_{t+1}^{NC,TJ^*}(A_j) + \beta\left(1 - p_{FT}\right) V_{t+1}^{NC,NJ}(A_j) \right\} \tag{34}$$

with,

$$c_t = z^{FT} w_t + (1 + r) A_i - A_j \tag{35}$$

Part-time:

$$V_t^{NC,PT}(A_i) = \max_{A_j} \left\{ U\left(c_t, 1 - z^{PT}\right) + \beta p_{PT} V_{t+1}^{NC,TJ^*}(A_j) + \beta\left(1 - p_{PT}\right) V_{t+1}^{NC,NJ}(A_j) \right\} \tag{36}$$

with,

$$c_t = z^{PT} w_t + (1 + r) A_i - A_j \tag{37}$$

No Job:

$$V_t^{NC,NJ}(A_i) = \max_{A_j} \left\{ U(c_t, 0.2) + \beta p_{NJ} V_{t+1}^{NC,TJ^*}(A_j) + \beta\left(1 - p_{NJ}\right) V_{t+1}^{NC,NJ}(A_j) \right\} \tag{38}$$

with,

$$c_t = (1 + r) A_i - A_j \tag{39}$$

In every period and for the three possible employment states, the optimal saving decisions, $A_j^{C,FT}$, $A_j^{C,PT}$ and $A_j^{C,NJ}$, are retained.

3).We compute the optimal amount of working hours by:

$$V_t^{NC,TJ^*}(A_i) = \max\left\{ V_t^{NC,FT}(A_i), V_t^{NC,PT}(A_i), V_t^{NC,NJ}(A_i) \right\} \tag{40}$$

and for every period t, the optimal number of working hours is retained in an index vector TJ^*.

4). We go back to step 2) and repeat until $t = 0$.

Once the optimal number of working hours is determined for $t = 1, ..., 50$, the complete history of working hours and optimal savings can be recovered from TJ^* and $A_j^{C,FT}$, $A_j^{C,PT}$ and $A_j^{C,NJ}$.

The value functions for "child" and "no child" states, obtained following the abovementioned steps are graphically depicted, jointly with optimal saving and working hours, in Figures 4-6.

Appendix 2

Table 6 a): Probability of being employed (t)				
	Spain		Netherlands	
	Coeff	t	Coeff	t
Age				
20-29				
30-35	$0,110$	$1,43$	$0,101$	$1,02$
36-45	$0,170$	$2,00$	$0,141$	$1,39$
Education				
Primary				
Secondary	$0,456$	$6,61$	$0,614$	$5,46$
Tertiary	$1,095$	$12,51$	$1,048$	$7,57$
Education of the partner				
Primary				
Secondary	$0,109$	$1,47$	$-0,058$	$-0,41$
Tertiary	$0,333$	$4,15$	$-0,083$	$-0,54$
New born child	$-0,159$	$-2,16$	$0,115$	$1,35$
Children 12-15 in the household	$0,212$	$3,57$	$0,383$	$6,72$
N^o members in the household	$-0,102$	$-3,11$	$-0,204$	$-6,34$
Disability	$-0,194$	$-1,87$	$-0,468$	$-6,99$
Partner in low-wage employment	$0,856$	$13,76$	$0,615$	$5,51$
Constant	$-0,748$	$-5,45$	$0,390$	$1,79$
N	7286		5074	
Log pseudolikelihood	-7484		-5690	

Table 6 b): Probability of being in part-time (t)[24]				
	Spain		Netherlands	
	Coeff	t	Coeff	t
Age				
20-29				
30-35	$-0,045$	$-0,35$	$0,404$	$3,76$
36-45	$-0,011$	$-0,09$	$0,477$	$4,53$
Education				
Primary				
Secondary	$-0,034$	$-0,23$	$0,461$	$3,22$
Tertiary	$0,125$	$0,57$	$0,567$	$3,37$
New born child	$0,004$	$0,03$	$0,167$	$1,77$
Kidgarden	$-0,995$	$-3,12$	$-0,283$	$-4,20$
Education of the partner				
Primary				
Secondary	$-0,083$	$-0,65$	$-0,143$	$-1,01$
Tertiary	$-0,087$	$-0,64$	$-0,332$	$-2,13$
Partner in low-wage employment	$-0,482$	$-2,47$	$-1,068$	$-11,73$
Constant	$-1,278$	$-3,26$	$-0,540$	$-2,40$
N	7286		5074	
Log pseudolikelihood	-7484		-5690	

[24] Sector and occupational dummies included in the part-time employment equation.

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